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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Woo-Jong Park

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10/17/2006

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EXAMINER

MEW, KEVIN D

ART UNIT

PAPER NUMBER

2616

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Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 09/716,998	Applicant(s) PARK, WOO-JONG	
	Examiner Kevin Mew	Art Unit 2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-10 and 12-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-7,9 and 13-18 is/are rejected.
- 7) ☒ Claim(s) 8, 10, 12, 19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Detailed Action

Response to Amendment

1. Applicant's arguments filed on 10/24/2005 regarding claims 1-3, 5-10, 12-19 have been fully considered. Claims 1-3, 5-10, 12-19 are currently pending and claims 4, 11 have been canceled by the applicant.
2. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-3, 13, 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Ganesh et al. (US Publication 2002/0051450).

Regarding claim 1, Ganesh discloses an address search apparatus in a switching device for an Ethernet switch that forwards network traffic comprising:

multiple ports (**a plurality of ports**, see line 5, section "0008", page 1, and Figure 2);

a local search block (see element 60, Figure 3) for a port, each port associated with a

local lookup table in memory (**a plurality of local search blocks corresponding to each of said**

plurality of ports, see element 58, Figure 3), said plurality of local lookup tables are used for analyzing source addresses learned by the corresponding ports (**provide a source address thereof**) and destination address that the corresponding ports recently forwarded a frame to in order to determine which port to forward the traffic over (**said plurality of local search blocks configured to analyze a destination address of an input packet received in the port thereof to search for a transmission port of said Ethernet switch**, see lines 6-12, section “0009”, page 1);

a main search unit (see elements 34, 36, Figure 2; note that the main search unit includes central management module and central lookup table) that includes a central management module for learning new source addresses by storing the source addresses received from line interfaces (**ports**) in a central lookup table (**configured to analyze said source address to establish an address data structure of said plurality of local search blocks**, see lines 1-9, section “0036”, page 4), and for receiving port requests for information relating to the destination address and responding by searching the central lookup table (**using said address data structure**) and the main search unit configured to respond to a destination address request from at least one of said plurality of local search blocks by either providing said requested destination address to a corresponding local search block by using said address data structure when said main search unit has said destination address (**central management module responds to the lookup request for destination address and passes the results about the destination address back to the port**, see lines 18-23, section “0030”, page 4) or by sending a “no port” signal to said at least one of said plurality of local search blocks when said main search unit does not have said destination address.

a switch fabric control which is a scheduler that establishes a connection so that a search engine on one port can directly pass a network frame to a search engine on another port (**a scheduler for controlling said local search blocks and said main search unit to enable an interface therebetween**; note that “another port” is interpreted as the main search unit in this case, see lines 1-7, section “0028”, page 3).

Regarding claim 2, Ganesh further discloses a plurality of ports (see Figure 2), each port comprises a local search block (**a plurality of local search blocks**, see element 60, Figure 3), which includes:

a destination address table having destination addresses and port number (**a destination table having destination addresses and destination information corresponding to said destination addresses which are matched therein**, see elements 40, 49, Figure 2);

a source address table having source addresses and port number (**a source table having source addresses and source information corresponding to said source addresses which are matched therein**, see elements 40, 49, Figure 2);

a packet analysis and key extraction logic (**address sorting logic**) extracts source and destination addresses, and virtual LAN information from the network frame, and creates a key which is passed to the binary search engine (**an address sorting logic configured to classify an Ethernet address into groups as many as necessary, and corresponding to each of said destination address table and said source address table**, see lines 1-8, section “0025”, page 3 and element 66, Figure 3);

a management processor (**a control logic**), coupled to the search engine, maintains the local lookup table and directs the search engine to delete old table entries, insert new table entries and general maintain the table in sorted order so that the search engine performs searches efficiently and correctly (**a control logic for control of corresponding local search blocks**, see lines 4-10, section "0026", page 3); and

a temporary packet storage holds network frame temporarily (**a register unit for temporal storage of data**, see lines 1-4, section "0024", page 3).

Regarding claim 3, Ganesh further discloses the main search unit that includes:

the central lookup table that includes network addresses and port numbers associated with the network addresses (**an address table for storing addresses known to the Ethernet switch system, and port information corresponding to said addresses**, see lines 2-4, section "0009", page 1 and element 34, Figure 2);

the central management module for searching the central lookup table for destination address (**a table access logic for accessing said address table**, see lines 19-20, section "0030", page 4);

a central management module for learning new source addresses from the line interfaces (**a control unit for control and condition detection of elements**, see lines 1-9, section "0036", page 4).

Although Ganesh does not explicitly show that the central management module comprises an address sorting logic for classifying addresses having same characteristics to store data known to the Ethernet switch system into said address table.

However, Ganesh discloses a packet analysis and key extraction logic (**address sorting logic**) extracts source and destination addresses, and virtual LAN information from the network frame, and creates a key which is passed to the binary search engine (**an address sorting logic for classifying an Ethernet address into groups as many as necessary, and corresponding to each of said destination address table and said source address table**, see lines 1-8, section “0025”, page 3 and element 66, Figure 3);

Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to modify the main search unit of Ganesh such that a sorting logic is in place to classify addresses having same characteristics into the central lookup table such as the packet analysis and key extraction logic taught by Ganesh. The motivation to do so is to allow the search engine of the local lookup table to perform searches efficiently and correctly because table entries that are in sorted order would allow faster data retrieval.

Regarding claim 13, Ganesh discloses the apparatus of claim 1, said plurality of local search blocks being configured to compare said destination address of said received input packet with addresses stored in a table using a hash algorithm (see lines 1-4, section “0082”, page 6).

Regarding claim 16, Ganesh discloses the apparatus of claim 2, said address sorting logic and said control logic being configured to perform a hash algorithm for said classifying Ethernet address into groups (see lines 1-4, section “0082”, page 6).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 5-7, 9, 14-15, 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ganesh in view of Morrow et al. (USP 5,111,453).

Regarding claims 5, 6, 17, 18, Ganesh discloses an address search method comprising the steps of:

the media interface receives a network frame from the network (**determining whether or not a port has received an information packet for transmission**, see lines 3-4, section "0029", page 3);

the network frame contains a destination address that indicates the ultimate destination for the network frame;

search engine searches memory to determine whether the destination address from the network frame is located within the lookup table of memory (**reading a destination address from a header of said information packet; determining whether said destination address exists in a local search block of said port**, see lines 6-8, section "0029", page 3);

forwarding the frame to the destination address if a network address matches the destination address (**transmitting said information packet to said destination address if destination address is in said local search block of said port**, see lines 10-13, section "0029", page 3);

Ganesh does not explicitly show that the switching device would determine if the destination address of a packet is not the same as a source address, and forward the frame to the destination address only if the destination address is not the same as the source address.

However, Morrow discloses a bridge that comprises an address recognizer that stores source addresses and determines whether the destination address of an incoming packet is the same as a stored source address (see col. 4, lines 32-38 and elements 10, 26, Fig. 3) and forwards the packet to another LAN if the destination address is not the same as any source address in the source address database (col. 4, lines 32-61 and Fig. 4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the destination address search method of Ganesh with the teaching of Morrow in implementing an address recognizer in a bridge device so that it will forward the incoming packet to another LAN when it determines the destination address of the packet is not the same as a source address in the source address database such that the switching device of Ganesh would determine if the destination address of a packet is not the same as a source address, and forward the frame to the destination address only if the destination address is not the same as the source address.

The motivation to do so is to enable the switching device of Ganesh to make a recognition decision and be able to either forward the packet to the other LAN or filter the packet in order to support a high speed data throughput.

Regarding claim 7, Ganesh further discloses all the limitations of the method as described in claim 5 above, further comprising the steps of:

the search engine of each port of the local search block (see element 60, Figure 3) searches for the destination address and requests the central management module of the main search unit for information relating to destination address if the destination address is not in the lookup table for the port (**notifying a main search block if said destination address is not found in said local search block of said port**, see lines 14-19, section "0030", page 4);

the central management module of the main search block searches the central lookup table (**performing an internal search by said main search block**, see lines 19-21, section "0030", page 4);

the central management module of the main search block passes the results, which includes information about the destination address, back to the port, and the port then adds the destination address to its local lookup table (**updating said local search block of said destination address if said main search block comprises said destination address; adding destination address to said local search block**, see lines 21-23, section "0030", page 4); and

forwarding the frame to the destination address if a network address matches the destination address (**transmitting said information packet to said destination address**, see lines 10-13, section "0029", page 3).

Regarding claim 9, Ganesh further discloses the central memory module of the main search block (see elements 34, 36, Figure 2) would delete aging entries, which have not been seen on any line card for a while (**main search block purges addresses that have not recently been used**, see lines 2-8, section "0045", page 5).

Regarding claim 14, Ganesh discloses all the aspects of claim 1 above, except fails to explicitly show the apparatus of claim 1, each local search block being configured to filter all received input packets that have a destination address the same as its own port.

However, Morrow discloses a bridge device that comprises an address recognizer that stores source addresses and determines whether the destination address of an incoming packet is the same as a stored source address (see col. 4, lines 32-38 and elements 10, 26, Fig. 3) and filters the packet if the destination address is the same as any source address in the source address database (col. 4, lines 32-61 and Fig. 4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the destination address search method of Ganesh with the teaching of Morrow in implementing an address recognizer in a bridge device so that it will forward the incoming packet to another LAN when it determines the destination address of the packet is not the same as a source address in the source address database such that the local search block of Ganesh is configured to filter all received input packets that have a destination address the same as its own port.

The motivation to do so is to enable the switching device of Ganesh to make a recognition decision and be able to filter the packet in order to support a high speed data throughput.

Regarding claim 15, Ganesh discloses all the aspects of claim 2 above, except fails to explicitly disclose the apparatus of claim 2, the address sorting logic and the control logic being configured to determine whether the source address and the destination address of a received input packet are the same and the address sorting logic and the control logic being configured to filter a received input packet when the source address and the destination address are the same.

However, Morrow discloses a bridge that comprises an address recognizer that stores source addresses and determines whether the destination address of an incoming packet is the same as a stored source address (see col. 4, lines 32-38 and elements 10, 26, Fig. 3) and forwards the packet to another LAN if the destination address is not the same as any source address in the source address database (col. 4, lines 32-61 and Fig. 4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the destination address search method of Ganesh with the teaching of Morrow in implementing an address recognizer in a bridge device so that it will forward the incoming packet to another LAN when it determines the destination address of the packet is not the same as a source address in the source address database such that the address sorting logic and the control logic of Ganesh is configured to determine whether the source address and the destination address of a received input packet are the same and the address

sorting logic and the control logic being configured to filter a received input packet when the source address and the destination address are the same.

The motivation to do so is to enable the switching device of Ganesh to make a recognition decision and be able to either forward the packet to the other LAN or filter the packet in order to support a high speed data throughput.

Allowable Subject Matter

5. Claims 8, 10, 12, 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

In claim 8, the method of claim 7, further comprising the steps of:

sending no-port information from said main search block to said port device if said main search block does not comprise said destination address; and

broadcasting said information packet to all ports in said Ethernet switch by said port device.

In claim 12, the apparatus of claim 1, each of said plurality of local search blocks being configured to broadcast to said input packet to all of said plurality of ports when in receipt of said "no port" signal from said main search unit.

In claim 19, the method of claim 5, said broadcasting occurring only when said main search block does not comprise the destination address.

Response to Arguments

6. Applicant's arguments with respect to claims 1-3, 5-10, 12-19 have been considered but claims 1-3, 5-7, 9, 13-18 are moot in view of the new ground(s) of rejection whereas claims 8, 10, 12, 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. In addition, the limitations "or by sending a "no port" signal to said at least one of said plurality of local search blocks when said main search unit does not have said destination address" as recited in the lines 13-14 of claim 1 are considered as optional/alternative limitations because of the word "or" such that only the limitations cited after the word "either" but prior to the word "or" are considered by the examiner.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Mew whose telephone number is 571-272-3141. The examiner can normally be reached on 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on 571-272-3174. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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